

# Alternative Solution for the Pipeline Transport of Viscous Oil using the Heaters in Pumping Stations

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## Abstract

There are several possibilities to transport the viscous crude by pipeline. The best known are the transportation of the product mixed with a diluent and the transport with heating of the product.

In the 1st case the disadvantages are:

- a) Reduction of the efficiency of transport caused by the diluent product
- b) Harm the environment in the event of loss of the product.
- c) Increase in the cost of transport.

In the 2nd case the major drawback lies in the selection and dimensioning of stations pumping and heating of the viscous oil

The original idea of this paper is to propose a method of reduction in viscosity of oil by heating. The difference lies in the type of proposed heating. Indeed, it is to practice heating inside pumping stations. The distances and the type of pump with motor drive will be chosen on the basis of thermal and hydraulic calculations that will determine the optimal distance of reheating, i.e. the distances travelled by the product in turbulent regime.

It is suggested to set heaters in storage tanks in pumping stations at the optimal distance of flow corresponding to the turbulent regime. The advantage of this process is to save heating energy and pumping. So the product will retain its initial properties. We propose a theory based on the thermal and hydraulic calculations of oil pipeline to determine reheating range, the temperature corresponding to the flow regime change for a given oil type (each type of product has its own temperature limit of heating), the generated load losses, the number of heating, pumping stations and the necessary thickness of insulation to maintain as far as possible the heat in the oil pipeline.

**Keywords** - Viscosity, Heating, Efficiency, Environment, Economy of transport.